Remarks

TELEPHONIC INTERVIEW SUMMARY

On January 12, 2007, a telephone interview was conducted with the Examiner to discuss a proposed Amendment After Final Office Action submitted to the Examiner on January 4, 2007. Responsive to the Office Communication of January 25, 2007, Applicants provide a summary of that interview. During the interview, the Examiner stated that the proposed amendments overcame the objections to claims 1, 23, 27, and 32 regarding certain informalities. However, the Examiner maintained the prior art rejections of claims 1-7 and 9-34. Thus, no agreement was reached regarding the Examiner's claim rejections based on prior art.

In the Office Action mailed on May 4, 2006, the Examiner objected to certain informalities in claims 1, 23, 27, and 32.

Claims 1, 23, 27, and 32 have been amended to address the Examiner's objections.

The Examiner also rejected claims 1-7, 9-21, and 27-34 under 35 U.S.C. 102(b) as being anticipated by Kirchoff et al., U.S. Patent No. 3,972,545.

CLAIM 1

In response, Applicants believe that claim 1 is not anticipated by Kirchoff et al. '545 because the reference does not disclose all of the elements recited in the claim. Claim 1 as amended recites:

> "1. An inflator comprising:
> an inflator body;
> a substantially cylindrical booster cup extending in said body, said booster cup having an outer peripheral wall and an end surface extending radially inwardly from said wall;
> *a plurality of apertures formed in said outer peripheral wall;*
> a first propellant charge positioned in said booster cup;
> a second propellant charge positioned in said inflator body;
> an initiator assembly *operable to activate said first propellant charge*, wherein a combustion thereof initiates a combustion of said second propellant charge and ejection of an inflation gas from said inflator body;
> a filter abutting said booster cup end surface;
> a perforated disc abutting said filter; and
> a nozzle positioned at an end of said inflator and abutting said perforated disc for supplying an inflation gas to an inflatable restraint system. "(emphasis added)

Thus, the inflator described in claim 1 includes a plurality of apertures formed in an outer peripheral the outer wall of the booster cup and, *at the same time*, an initiator assembly *operable to activate* a propellant charge. In contrast, tube 34 of the cited reference does *not* disclose an inflator including the simultaneous existence of both a plurality of apertures formed in an outer peripheral wall of a booster cup *and* an initiator assembly *operable to activate a propellant charge.*

Column 3, lines 34-48 of the reference state:

> "When the vehicle, in which the present invention is installed, collides with some other object, sensing devices, not a part of the present invention, deliver an electric signal. This signal or signals will then cause one or both electric squibs 19 and 20 to be fired. If the impact is severe, both squibs will be fired simultaneously for maximum effectiveness in delivering gases to the inflatable structure with maximum speed. However, if the impact is less severe, only the downstream squib 20 will be fired. In the latter case, combustion will proceed upstream through the partition 15 to ignite the squib 19 and the gas generant 18 in the upstream chamber 16. This provides a slower rate of inflation to provide a softer cushioning effect, but with the same quantity of gas."

Thus, in the case where both squibs 19 and 20 are fired simultaneously, the wall of tube 34 of the reference is not ruptured until *after* firing of the squibs, and until the wall is ruptured after activation of the squibs, there are no openings in the wall. However, *after* activation of the squibs and subsequent formation of any openings in tube 34, neither of the squibs is "...operable to activate the first propellant charge..." as recited in claims _, because at that point the squibs have been fired.

In the case where squibs 19 and 20 are activated sequentially, squibs 19 and 20 of the reference essentially define *two separate initiation* systems, with each initiation system configured for igniting gas generant in a corresponding one of chambers 16 and 17. As stated in column 2, lines 66-68, continuing through to column 3, line 1:

> "Each chamber 16 and 17 is further equipped with an electric squib 19 and 20, respectively, surrounded by a pyrotechnic material 21. This material 21 may also be any one of a number of compositions; but, in our preferred embodiment, comprises a granular mixture of 25% by weight of boron and 75% of potassium nitrate."

The walls of tube 34 are not ruptured until *after* firing of either squib, and until the walls are ruptured, there are no openings in the walls. However, *after* activation of a squib and subsequent formation of any resulting openings in tube 34, that squib is no longer "...operable to activate..." an associated propellant charge in an associated one of chambers 16 and 17, because at that point the squib has been fired. If the structure disclosed in Kirchoff et al. '545 did not form separate initiation mechanisms, then any activation of either of squibs 19 or 20 would result in near-simultaneous combustion of all the gas generant in *both* of chamber 16 and 17, making the phased gas deployment described above impossible.

Furthermore, the *simultaneous existence* in the inflator of the present invention of "a plurality of apertures formed in said outer peripheral wall and "an initiator assembly operable to activate said first propellant charge" is explicit, or at the very least inherent, in the language of claim 1.

In addition, the gas generator of Kirchoff et al. '545 does not disclose all of the following features recited in amended claim 1:

> "... a substantially cylindrical booster cup extending in said body, said booster cup having an outer peripheral wall *and an end surface extending radially inwardly from said wall*;...
> a filter abutting said booster cup end surface;
> a perforated disc abutting said filter; and

a nozzle positioned at an end of said inflator and abutting said perforated disc for supplying an inflation gas to an inflatable restraint system. "

The Examiner's point that a filter can include multiple components is well-taken. However, Applicants believes that the gas generator of Kirchoff et al. '545 incorporates *two separated* filters, rather than a *single* filter as disclosed in the present invention. Filtering screens 22 and coarse screen 24 forms a first filter assembly and cooling means 29 and 30 combine to form the second filter assembly. As stated in column 3, lines 9-28 of the reference, these two filters are separated by a plastic-film bag 25, containing a pH neutralizing material 26 and retained in a position adjacent a first perforated plate 23 by a second perforated plate 27. This neutralizing material 26 is *not* a filter, but rather is positioned to induce a neutralizing chemical treatment of the effluent exiting screens 24, to reduce the pH of the effluent. All effluent exiting screens 24 *must* pass through neutralizing material 26 before passing to cooling means 29 and 30 for cooling and/or further filtering. Thus, neutralizing material 26 is not a filter but rather *separates* the two filters formed by screens 22, 24 and cooling means 29, 30.

As the two filters described in the reference are separated, *neither* of the filters (screens 22, 24 or cooling means 29, 30) include all of the above-mentioned features recited in claim 1. That is, neither filter abuts both the booster cup end surface *and* a perforated disc which abuts a nozzle "positioned at an end of said inflator... for supplying an inflation gas to an inflatable restraint system "as set forth in claim 1.

For the reasons set forth above, Kirchoff et al. '545 does not disclose all of the elements recited in amended claim 1 of the present application. Thus, the rejection of claim 1 under 35 U.S.C. 102(b) as being anticipated by Kirchoff et al. '545 should be withdrawn.

CLAIM 7

In addition, the gas generator of Kirchoff et al. '545 does not disclose all of the following features recited in claim 7:

"...a booster cup extending in said body and having an outer peripheral wall and *an end surface extending inwardly from said outer peripheral wall...*
a filter abutting said booster cup end surface;
a perforated disc abutting said filter; and
a nozzle positioned at said second end of said body *and abutting said perforated disc*, said nozzle defining a nozzle outlet for supplying an inflation gas to the inflatable restraint system.

As stated previously, the Examiner's point that a filter can include multiple components is well-taken. However, also as stated previously, Applicants believes that the gas generator of Kirchoff et al. '545 incorporates *two separated* filters, rather than a *single* filter as disclosed in the present invention. Filter screens 22 and coarse screen 24 form a first filter and cooling means 29 and 30 combine to form the second filter. As stated in column 3, lines 9-28 of the reference, these two filters are separated by a plastic-film bag 25, containing a pH neutralizing material 26 and retained in a position adjacent a first perforated plate 23 by a second perforated plate 27. This neutralizing material 26 is *not* a filter, but rather is positioned to induce a chemical reaction between the effluent exiting screens 24 and the neutralizing material 26, to reduce the pH of the effluent. All effluent exiting screen 24

In addition, the gas generator of Kirchoff et al. '545 does not disclose all of the following features recited in amended claim 27. Claim 27 recites:

> "27. An inflator module for a vehicle occupant protection system comprising:
> a module housing;
> an inflator positioned in said housing, said inflator comprising a booster cup mounted to an inflator body and extending substantially coaxially therewith, said booster cup having an outer peripheral wall partially defining an annular space and a plurality of apertures formed in said outer peripheral wall;
> a propellant charge positioned in said space;
> a filter positioned in said inflator abutting an end portion of said booster cup *for securing said propellant charge in said space*;
> a perforated disc abutting said filter; and
> a nozzle positioned at an end of said inflator and abutting said perforated disc for supplying an inflation gas to the inflatable vehicle occupant protection system. "(emphasis added)

As stated previously, Applicants believes that the gas generator of Kirchoff et al. '545 incorporates *two* filters are separated by a plastic-film bag 25. As the two filters described in the reference are separated, *neither* of the filters (screens 22, 24 or cooling means 29, 30) include all of the above-mentioned features recited in claim 27. That is, neither filter secures a propellant charge in place, *and* abuts both the booster cup *and* a perforated disc which abuts a nozzle "positioned at an end of said inflator... for supplying an inflation gas to an inflatable vehicle occupant protection system " as set forth in claim 27.

For the reasons set forth above, Kirchoff et al. '545 does not disclose all of the elements recited in claim 27 of the present application. Thus, the rejection of claim 27 under 35 U.S.C. 102(b) as being anticipated by Kirchoff et al. '545 should be withdrawn.

CLAIM 30

In addition, the gas generator of Kirchoff et al. '545 does not disclose all of the following features recited in amended claim 27. Claim 30 recites:

> "30. A method of manufacturing a gas generator comprising the steps of:
> positioning a booster cup within an elongate substantially cylindrical inflator body;
> placing a propellant charge in a space extending between an outer peripheral wall of the booster cup and an inner peripheral wall of the inflator body;
> *inserting a filter member into the inflator body up to a point at which the filter bears against an end surface of the booster cup;*
> *positioning a perforated disc abutting said filter; and*
> positioning a nozzle member in the inflator body at a selected axial position *and abutting said perforated disc such that the filter is constrained from axial movement between the nozzle member and the booster cup, whereby the filter secures the propellant charge in the space.*" (emphasis added)

As stated previously, Applicants believes that the gas generator of Kirchoff et al. '545 incorporates *two* filters are separated by a plastic-film bag 25. As the two filters described in the reference are separated, *neither* of the filters (screens 22, 24 or cooling means 29, 30) include all of the above-mentioned features recited in claim 30.

must pass through neutralizing material 26 before passing to cooling means 29 and 30 for cooling and/or further filtering. Thus, neutralizing material 26 is not a filter but rather *separates* the two filters formed by screens 22, 24 and cooling means 29, 30.

As the two filters described in the reference are separated, *neither* of the filters (screens 22, 24 or cooling means 29, 30) include all of the above-mentioned features recited in claim 7. That is, neither filter abuts both the booster cup end surface *and* a perforated disc which abuts a nozzle positioned at a second end of the inflator body for supplying an inflation gas to an inflatable restraint system as described in claim 7.

For the reasons set forth above, Kirchoff et al. '545 does not disclose all of the elements recited in amended claim 7 of the present application. Thus, the rejection of claim 7 under 35 U.S.C. 102(b) as being anticipated by Kirchoff et al. '545 should be withdrawn.

CLAIM 14

In addition, the gas generator of Kirchoff et al. '545 does not disclose all of the following features recited in claim 14. Claim 14 of the present application recites:

> "14. An inflatable restraint system for a motor vehicle comprising:
> an inflatable restraint device;
> an inflator operable to provide an inflation gas to said inflatable restraint device, said inflator comprising an elongate substantially cylindrical inflator body having first and second ends and an inner peripheral wall;
> an elongate booster cup mounted to said inflator body proximate said first end and extending substantially coaxially therewith, said booster cup having an outer peripheral wall separated from said inner peripheral wall by an annular space, and a plurality of apertures formed in said outer peripheral wall;
> a propellant charge positioned in said space;
> a filter positioned in said inflator body *abutting an end portion of the booster cup , said filter securing said propellant charge in said space;*
> *a perforated disc abutting said filter; and*
> *a nozzle member proximate said second end of said inflator body and abutting said perforated disc,* said nozzle member constraining said filter against axial displacement." (emphasis added)

For the reasons set forth previously, Applicants believes that the gas generator of Kirchoff et al. '545 incorporates *two* filters are separated by a plastic-film bag 25. As the two filters described in the reference are separated, *neither* of the filters (screens 22, 24 or cooling means 29, 30) include all of the above-mentioned features recited in claim 14. That is, neither filter secures a propellant charge in place, *and* abuts both the booster cup *and* a perforated disc which abuts a nozzle member constraining the filter against axial displacement, as described in claim 14.

For the reasons set forth above, Kirchoff et al. '545 does not disclose all of the elements recited in claim 14 of the present application. Thus, the rejection of claim 14 under 35 U.S.C. 102(b) as being anticipated by Kirchoff et al. '545 should be withdrawn.

CLAIM 27

That is, neither filter secures a propellant charge in place, *and* abuts both the booster cup end surface *and* a perforated disc which abuts a nozzle member, as described in claim 30.

For the reasons set forth above, Kirchoff et al. '545 does not disclose all of the elements recited in claim 30 of the present application. Thus, the rejection of claim 30 under 35 U.S.C. 102(b) as being anticipated by Kirchoff et al. '545 should be withdrawn.

The Examiner also rejected claims 14 and 22-26 under 35 U.S.C. 103(a) as being unpatentable over Schneider et al., U.S. Patent No. 6,279,945, in view of Kirchoff et al. '545.

CLAIM 14

Claim 14 of the present application recites:

"14. An inflatable restraint system for a motor vehicle comprising:
an inflatable restraint device;
an inflator operable to provide an inflation gas to said inflatable restraint device, said inflator comprising an elongate substantially cylindrical inflator body having first and second ends and an inner peripheral wall;
an elongate booster cup mounted to said inflator body proximate said first end and extending substantially coaxially therewith, said booster cup having an outer peripheral wall separated from said inner peripheral wall by an annular space, and a plurality of apertures formed in said outer peripheral wall;
a propellant charge positioned in said space;
a filter positioned in said inflator body *abutting an end portion of the booster cup , said filter securing said propellant charge in said space;*
a perforated disc abutting said filter; and
a nozzle member proximate said second end of said inflator body and abutting said perforated disc, said nozzle member constraining said filter against axial displacement." (emphasis added)

For the reasons set forth previously, Applicants believes that the gas generator of Kirchoff et al. '545 incorporates *two* filters are separated by a plastic-film bag 25. As the two filters described in the reference are separated, *neither* of the filters (screens 22, 24 or cooling means 29, 30) include all of the above-mentioned features recited in claim 14. That is, neither filter secures a propellant charge in place, *and* abuts both the booster cup *and* a perforated disc which abuts a nozzle member constraining the filter against axial displacement, as described in claim 14.

For the reasons set forth above, Kirchoff et al. '545 does not show or suggest the above-mentioned elements recited in claim 14 of the present application. In addition, Schneider et al. '945 does not show or suggest the above-mentioned features of the present invention. Thus, even if the references were combined, no combination of the references would provide the above-mentioned features of the present invention. Therefore, the rejection of claim 14 under 35 U.S.C. 103(a) as being unpatentable over Schneider et al. '945 in view of Kirchoff et al. '545 should be withdrawn.

CLAIM 23

Claim 23 as amended recites:

"23. An inflatable airbelt system for a motor vehicle comprising:

an inflatable airbelt;

an inflator operable to provide an inflation gas to said airbelt, said inflator comprising an inflator body and a booster cup extending in said body, said booster cup having an outer peripheral wall and an end surface extending radially inwardly from said wall;

said booster cup includes a plurality of apertures formed in said outer peripheral wall;

a first propellant charge positioned in said booster cup;

a second propellant charge positioned in said inflator body;

an initiator assembly *operable to activate said first propellant charge*, wherein a combustion thereof initiates a combustion of said second propellant charge via said apertures;

a filter abutting said booster cup end surface;

a perforated disc abutting said filter; and

a nozzle positioned at an end of said inflator and abutting said perforated disc for supplying an inflation gas to the inflatable airbelt system." (emphasis added)

Thus, the inflator described in claim 23 includes a plurality of apertures formed in an outer peripheral the outer wall of the booster cup and, *at the same time,* an initiator assembly *operable to activate* a propellant charge. In contrast, tube 34 of the cited reference does *not* disclose an inflator including the simultaneous existence of both a plurality of apertures formed in an outer peripheral wall of a booster cup *and* an initiator assembly *operable to activate a propellant charge.*

Column 3, lines 34-48 of the reference state:

"When the vehicle, in which the present invention is installed, collides with some other object, sensing devices, not a part of the present invention, deliver an electric signal. This signal or signals will then cause one or both electric squibs 19 and 20 to be fired. If the impact is severe, both squibs will be fired simultaneously for maximum effectiveness in delivering gases to the inflatable structure with maximum speed. However, if the impact is less severe, only the downstream squib 20 will be fired. In the latter case, combustion will proceed upstream through the partition 15 to ignite the squib 19 and the gas generant 18 in the upstream chamber 16. This provides a slower rate of inflation to provide a softer cushioning effect, but with the same quantity of gas."

Thus, in the case where both squibs 19 and 20 are fired simultaneously, the wall of tube 34 of the reference is not ruptured until *after* firing of the squibs, and until the wall is ruptured after activation of the squibs, there are no openings in the wall. However, *after* activation of the squibs and subsequent formation of any openings in tube 34, neither of the squibs is "...operable to activate the first propellant charge..." as recited in claim 23, because at that point the squibs have been fired.

In the case where squibs 19 and 20 are activated sequentially, squibs 19 and 20 of the reference essentially define *two separate initiation* systems, with each initiation system configured for a igniting gas generant in a corresponding one of chambers 16 and 17. As stated in column 2, lines 66-68, continuing through to column 3, line 1:

"Each chamber 16 and 17 is further equipped with an electric squib 19 and 20, respectively, surrounded by a pyrotechnic material 21. This material 21 may also be any one of a number of compositions; but, in our preferred embodiment, comprises a granular mixture of 25% by weight of boron and 75% of potassium nitrate."

The walls of tube 34 are not ruptured until *after* firing of either squib, and until the walls are ruptured, there are no openings in the walls. However, *after* activation of a squib and subsequent formation of any resulting

openings in tube 34, that squib is no longer "...operable to activate..." an associated propellant charge in an associated one of chambers 16 and 17, because at that point the squib has been fired. If the structure disclosed in Kirchoff et al. '545 did not form separate initiation mechanisms, then any activation of either of squibs 19 or 20 would result in near-simultaneous combustion of all the gas generant in *both* of chamber 16 and 17, making the phased gas deployment described above impossible.

Furthermore, the *simultaneous existence* in the inflator of the present invention of "a plurality of apertures formed in said outer peripheral wall and "an initiator assembly operable to activate said first propellant charge" is explicit, or at the very least inherent, in the language of claim 23.

For the reasons set forth above, Kirchoff et al. '545 does not show or suggest an inflator having a booster cup "...including a plurality of apertures formed in said outer peripheral wall..." and "...an initiator assembly operable to activate said first propellant charge..." as recited in claim 23. In addition, Schneider et al. '945 does not show or suggest the above-mentioned features of the present invention. Thus, even if the references were combined, no combination of the references would provide the above-mentioned features of the present invention. Therefore, the rejection of claim 23 under 35 U.S.C. 103(a) as being unpatentable over Schneider et al. '945 in view of Kirchoff et al. '545 should be withdrawn.

In addition, claim 23 as amended recites:

"23. An inflatable airbelt system for a motor vehicle comprising:
an inflatable airbelt;
an inflator operable to provide an inflation gas to said airbelt, said inflator comprising an inflator body and a booster cup extending in said body, said booster cup having an outer peripheral wall and *an end surface extending radially inwardly from said wall*;
said booster cup includes a plurality of apertures formed in said outer peripheral wall;
a first propellant charge positioned in said booster cup;
a second propellant charge positioned in said inflator body;
an initiator assembly operable to activate said first propellant charge, wherein a combustion thereof initiates a combustion of said second propellant charge via said apertures;
a filter abutting said booster cup end surface;
a perforated disc abutting said filter; and
a nozzle positioned at an end of said inflator and abutting said perforated disc for supplying an inflation gas to the inflatable airbelt system." (emphasis added)

For the reasons set forth previously, Applicants believes that the gas generator of Kirchoff et al. '545 incorporates two filters are separated by a plastic-film bag 25. As the two filters described in the reference are separated, neither of the filters (screen 22, 24 or cooling means 29, 30) include all of the above-mentioned features recited in claim 23. That is, neither filter abuts *both* the booster cup and a perforated disc which abuts a nozzle "positioned at an end of said inflator and abutting said perforated disc for supplying an inflation gas to the inflatable airbelt system ..." as described in claim 23. In addition, Schneider et al. '945 does not show or suggest the above-mentioned features of the present invention. Thus, even if the references were combined, no combination of the references would provide the above-mentioned features of the present invention. Therefore, the rejection of claim

23 under 35 U.S.C. 103(a) as being unpatentable over Schneider et al. '945 in view of Kirchoff et al. '545 should be withdrawn.

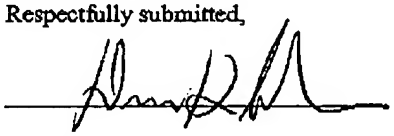
The inflator of the present invention provides important advantages over the devices disclosed in the cited references. The dimensions of the apertures formed the booster cup of the present invention are predetermined and permanent, facilitating more predictable flow of combustion products from the booster cup and combustion of the gas generant. This provides an inherently safer design. The pre-existing apertures formed in the booster cup also facilitate more rapid ignition of the gas generant; there is no delay in the transfer of combustion products from the booster cup to the gas generant due to the need to rupture the tube to create apertures. The present invention also utilizes a single filter rather than multiple filters, making it simpler, less costly, more compact, and easier to manufacture than the devices disclosed in the cited references. The added compactness of the present design makes it suitable for use in a wider variety of applications such as, for example, an airbelt.

Applicants submit that, as claim 1 is deemed patentable, claims 2-6 are also patentable as they depend from claim 1. Also, as claim 7 is deemed patentable, claims 9-13 are also patentable as they depend from claim 7. Also, as claim 14 is deemed patentable, claims 15-22 are also patentable as they depend from claim 14. Also, as claim 23 is deemed patentable, claims 24-26 are also patentable as they depend from claim 23. Also, as claim 27 is deemed patentable, claims 28-29 are also patentable as they depend from claim 27. Also, as claim 30 is deemed patentable, claims 31-34 are also patentable as they depend from claim 30.

In view of the above amendments and remarks, the Applicants respectfully submit that all rejections of record have been overcome. The Applicants respectfully requests favorable reconsideration and allowance of the present application.

Submitted herewith is a credit card authorization sheet to charge the amount of $120 to cover the cost of the one-month extension. The Commissioner is authorized to charge any deficiencies related to this paper to deposit account no. 50-3238.

Respectfully submitted,



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